

CORRELATION OF THE INFORMATION LITERACY STANDARDS AND INDIANA'S ACADEMIC STANDARDS FOR MATHEMATICS



**Prepared by the
Indiana Department of Education
School Library Media Specialists' Leadership Cadre
Information Literacy Task Force Committee**

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INFORMATION LITERACY STANDARDS FOR STUDENT LEARNING

The Indiana Department of Education, Office of Learning Resources, supports the need for the Indiana Academic Standards to address student library information literacy standards. Charged with this task, the School Library Media Specialists' (SLMS) Cadre Information Literacy Task Force Committee, a collaborative committee of members of the Indiana Department of Education's Technology Leadership School Library Media Specialists and the Association of Indiana Media Educators (AIME), developed a correlation document. It correlates to the Nine Information Literacy Standards developed by the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT) into the Indiana's Academic Standards for Mathematics.

A copy of this document, Correlation of the Information Literacy Standards and Indiana's Academic Standards for Mathematics, is available at www.doe.state.in.us/olr.

Purpose of the Correlation of Information Literacy Standards and Indiana's Academic Standards for Mathematics

The mission of the school library program as stated in Information Power: Building Partnerships for Learning (1998) is to "ensure that students and staff are effective users of ideas and information."

The Correlation of the Information Literacy Standards and Indiana's Academic Standards for Mathematics identifies the Information Literacy Standards in the newly adopted Indiana Academic Standards for Mathematics. SLMS will use these standards to work cooperatively with the building principals, classroom teachers and other professional staff members to insure that student library information literacy standards are taught through a collaborative effort in all curricular areas.

Indiana Legal Requirements for School Library Media Program

The Indiana Administrative Code, 511 IAC 6.1-5.6 Media Program, delineates the minimum requirements for a school library media program:

Sec. 6. All schools shall have a media program that is an integral part of the educational program. A licensed media specialist shall supervise the media program. Each school shall spend at least eight dollars (\$8) per student per year from its 222000 account to maintain its media program. (*Indiana State Board of Education; 511 IAC 6.1-5.6; filed Jan 9, 1989, 11:00 a.m.: 12 IR 1192*)

Relationship Between Reading Improvement and School Library Media Program

The direct relationship between reading improvement and an active school library media program staffed by a licensed professional librarian is substantiated by research studies released in Colorado, Pennsylvania, and Alaska. [These published studies include: How School Librarians Help Kids Achieve Standards; the Second Colorado Study (April 2000); Information Empowered; The School Librarian as an Agent of Academic Achievement in Alaska Schools (1999); Measuring Up to the Standards; The Impact of School Library Programs and Information Literacy in Pennsylvania Schools (February 2000).] Pennsylvania, Massachusetts, and Texas have also published research studies relating to the impact of a viable school library media program.

A Study of the Differences Between Higher-and Lower-performing Indiana Schools, a study by NCREL commissioned by Superintendent of Public Instruction, Dr. Suellen Reed, was published in February 2000. The study reports one necessary component to increase student performance in lower-performing schools is to “increase student access to instructional and print materials in lower-performing schools, including regular and flexible access to a working library.”

In this context, a working school library with flexible access is open during the regular school hours, is staffed by a professional, licensed school library media specialist, and provides for open and easy access by individual students. Best practices support the use of collaboratively planned units involving the classroom teacher and the school library media specialist (SLMS). Dr. David V. Loertscher in Reinventing Indiana’s School Library Media Programs In the Age of Technology; A Handbook for Principals and Superintendents states that the library collection shall contain the “right materials for the right learners at the right time in every format available” to support curriculum and recreational reading needs. Through the use of Library Information Literacy Standards, teachers and SLMS work cooperatively to plan, teach, and assess the progress of students’ learning.

THE NINE INFORMATION LITERACY STANDARDS FOR STUDENT LEARNING

Information Literacy

The student who is information literate

- ILS 1: **accesses information** efficiently and effectively.
- ILS 2: **evaluates information** critically and competently.
- ILS 3: **uses information** accurately and creatively.

Independent Learning

The student who is an independent learner is information literate and

- ILS 4: **pursues information** related to personal interests.
- ILS 5: **appreciates** literature and other creative expressions of **information**.
- ILS 6: strives for excellence in information seeking and knowledge generation (**generates knowledge**).

Social Responsibility

The student who contributes positively to the learning community and to society is information literate and

- ILS 7: **recognizes the importance of information in a democratic society**.
- ILS 8: **practices ethical behavior** in regard to information and information technology.
- ILS 9: participates effectively in groups to pursue and generate information (**shares and collaborates**).

- **Bold face** on this page indicates shortened phrasing used in listing of the Nine Information Literacy Standards for Student Learning in the Correlation of the Information Literacy Standards and Indiana's Standards for Mathematics
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READING THE STANDARDS AT EACH GRADE LEVEL

Each Foreign Language Standard includes the following components to aid teachers in understanding Standards and incorporating them into their instruction.

Level 1: Communication		Title
	Standard 1: <i>Students engage in conversations, provide and obtain information, express feelings and emotions, and exchange opinions.</i>	Description
	Modern Languages	
1.1.1	Participate in brief guided conversations related to needs, interests, likes, and dislikes.	
1.1.2	Understand and use appropriate forms of address in courtesy expressions.	
1.1.3	Make introductions, presenting classmates, family members, and friends.	
1.1.4	Ask and answer simple questions.	
1.1.5	Make routine requests in the classroom and in public places.	
1.1.6	Describe state of being in simple phrases.	Indicator
1.1.7	Express basic agreement and disagreement.	
	Latin	
1.1.8	Give and respond to oral directions, commands, and make routine requests in the classroom.	
1.1.9	Understand and use appropriate forms of address.	
1.1.10	Ask and answer simple questions.	

[illegible]

INDICATOR NUMBER	CORRELATION OF THE INFORMATION LITERACY STANDARDS AND INDIANA'S ACADEMIC STANDARDS FOR MATHEMATICS Release date 2000	ILS 1 ACCESSES INFORMATION	ILS 2 EVALUATES INFORMATION	ILS 3 USES INFORMATION	ILS 4 PURSUES INFORMATION	ILS 5 APPRECIATES INFORMATION	ILS 6 GENERATES KNOWLEDGE	ILS 7 RECOGNIZES IMPORTANCE OF INFO TO DEMOCRATIC SOCIETY	ILS 8 PRACTICES ETHICAL BEHAVIOR	ILS 9 SHARES AND COLLABORATES
Grade 1										
	Standard 1: Number Sense									
	<i>Students understand symbols, objects, and pictures used to represent numbers up to 100 and show an understanding of fractions.</i> <i>INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland</i>									
1.1.1	Count, read, and write whole numbers up to 100.	x	x	x						
1.1.2	Count and group objects in ones and tens.	x	x	x						
1.1.3	Identify the number of tens and ones in numbers less than 100.	x	x	x						
1.1.4	Name the number that is one more than one less than any number up to 100.	x	x	x						
1.1.5	Compare whole numbers up to 10 and arrange them in numerical order.	x	x	x						
1.1.6	Match the number of names first, second, third, etc. with an ordered set of up to 10 items.	x	x	x						
1.1.7	Recognize when a shape is divided into congruent (matching) parts.	x	x							
1.1.8	For a shape divided into 8 or fewer congruent (matching) parts, describe a shaded portion as "___ out of ___ parts" and write the fraction.	x	x	x						
1.1.9	For a set of 8 or fewer objects, describe a subset as "___ out of ___ parts" and write the fraction.	x	x	x						
1.1.10	Represent, compare, and interpret data using pictures and picture graphs.	x	x	x	x	x	x		x	
	Standard 2: Computation									
	<i>Students demonstrate the meaning of addition and subtraction and use these operations to solve problems.</i>									
1.2.1	Show the meaning of addition (putting together, increasing) using objects.	x	x	x						
1.2.2	Show the meaning of subtraction (taking away, comparing, finding the difference) using objects.	x	x	x						
1.2.3	Show equivalent forms of the same number (up to 20) using objects, diagrams, and numbers.	x	x	x						
1.2.4	Demonstrate mastery of the addition facts (for totals up to 20) and the corresponding subtraction facts.	x	x	x						
1.2.5	Understand the meaning of symbols +, -, and =.	x	x							
1.2.6	Understand the role of zero in addition and subtraction.	x	x							
1.2.7	Understand and use the inverse relationship between addition and subtraction facts (such as 4 + 2 = 6, 6 - 2 = 4, etc.) to solve problems.	x	x	x						

	Standard 3: Algebra and Functions								
	<i>Students use number sentences with the symbols +, -, and = to solve problems.</i>								
1.3.1	Write and solve number sentences from problem situations involving addition and subtraction.	x	x	x					
1.3.2	Create word problems that match given number sentences involving addition and subtraction.	x	x	x	x	x	x		
1.3.3	Recognize and use the relationship between addition and subtraction.	x	x	x					
1.3.4	Create and extend number patterns using addition.	x	x	x	x	x	x		
	Standard 4: Geometry								
	<i>Students identify common geometric shapes, classify them by common attributes, and describe their relative position or their location in space.</i>								
1.4.1	Identify, describe, compare, sort, and draw triangles, rectangles, squares, and circles.	x	x	x					
1.4.2	Identify triangles, rectangles, squares, and circles as the faces of three-dimensional objects.	x	x	x	x				
1.4.3	Classify and sort familiar plane and solid objects by position, shape, size, roundness, and other attributes. Explain the rule you used.	x	x	x					
1.4.4	Identify objects as two- or three-dimensional.	x	x	x					
1.4.5	Give and follow directions for finding a place or object.	x	x	x	x	x	x		x
1.4.6	Arrange and describe objects in space by position and direction: near, far, under, over, up, down, behind, in front of, next to, to the left of or right of.	x	x	x					
1.4.7	Identify geometric shapes and structures in the environment and specify their location.	x	x	x					
	Standard 5: Measurement								
	<i>Students learn how to measure length, as well as how to compare, order, and describe other kinds of measurement.</i>								
1.5.1	Measure the length of objects by repeating a non-standard unit or a standard unit.	x	x	x					
1.5.2	Use different units to measure the length of the same object and predict whether the measure will be greater or smaller when a different unit is used.	x	x	x					
1.5.3	Recognize the need for a fixed unit of length.	x							
1.5.4	Measure and estimate the length of an object to the nearest inch and centimeter.	x	x	x					
1.5.5	Compare and order objects according to area, capacity, weight, and temperature, using direct comparison or a non-standard unit.	x	x	x					
1.5.6	Tell time to the nearest half-hour and relate time to events (before/after, shorter/longer).	x	x	x					
1.5.7	Identify and give the values of pennies, nickels, and dimes.	x	x	x					
	Standard 6: Problem Solving								
	<i>Students make decisions about how to set up a problem.</i> INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland								
1.6.1	Choose the approach, materials, and strategies to use in solving problems.	x	x	x					
1.6.2	Use tools such as objects or drawings to model problems.	x	x	x	x	x	x		
1.6.3	Explain the reasoning used and justify the procedures selected in solving a problem.	x	x	x	x	x	x		x
1.6.4	Make precise calculations and check the validity of the results in the context of the problem.	x	x	x					
1.6.5	Understand and use connections between two problems.	x	x	x					

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Grade 2										
	Standard 1: Number Sense									
	Students understand the relationships among numbers, quantities, and place value in whole numbers up to 100. They understand that fractions may refer to parts of a set and parts of a whole. INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland									
2.1.1	Count by ones, twos, fives, and tens to 100.	x	x	x						
2.1.2	Identify the pattern of numbers in each group of ten, from tens through nineties.	x	x	x	x					
2.1.3	Identify numbers up to 100 in various combinations of tens and ones.	x	x	x	x					
2.1.4	Name the number that is ten more or ten less than any number 10 through 90.	x	x	x						
2.1.5	Compare whole numbers up to 100 and arrange them in numerical order.	x	x	x						
2.1.6	Match the number of names first, second, third, etc. with an ordered set of up to 100 items.	x	x	x						
2.1.7	Identify odd and even number up to 100.	x	x							
2.1.8	Recognize fractions as parts of a whole or parts of a group (up to 12 parts).	x	x							
2.1.9	Recognize, name, and compare the unit of fractions: 1/2,1/3,1/4,1/5,1/6,1/8,1/10, and 1/12.	x	x	x						
2.1.10	Know that when all fractional parts are included, the result is equal to the whole and to one.	x								
2.1.11	Collect and record numerical data in systematic ways.	x	x	x						
2.1.12	Represent, compare, and interpret data using tables, tally charts, and bar graphs.	x	x	x	x	x	x		x	
	Standard 2: Computation									
	Students solve simple problems involving addition and subtraction of numbers up to 100. INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland									
2.2.1	Model addition of numbers less than 199 with objects and pictures.	x	x	x	x	x	x			
2.2.2	Add two whole numbers less than 100 with and without regrouping.	x	x	x						
2.2.3	Subtract two whole numbers less than 100 without regrouping.	x	x	x						
2.2.4	Understand and use the inverse relationship between addition and subtraction.	x	x	x						
2.2.5	Use estimation to decide whether answers are reasonable in addition problems.	x	x	x						
2.2.6	Use mental arithmetic to add or subtract 0, 1, 2, 3, 4, 5, or 10 with numbers less than 100.	x	x	x						

	Standard 3: Algebra and Functions								
	<i>Students model, represent, and interpret number relationships to create and solve problems involving addition and</i>								
2.3.1	Relate problem situations to number sentences involving addition and subtraction.	x	x	x					
2.3.2	Use the commutative and associative rules for addition to simplify mental calculations and to check results.	x	x	x					
2.3.3	Recognize and extend a linear pattern by its rules.	x	x	x	x	x	x		
2.3.4	Create, describe, and extend number patterns using addition and subtraction.	x	x	x	x	x	x		
	Standard 4: Geometry								
	<i>Students identify and describe the attributes of common shapes in the plane and of common objects in space.</i>								
2.4.1	Construct squares, rectangles, triangles, cubes, and rectangular prisms with appropriate materials.	x	x	x					
2.4.2	Describe, classify, and sort plane and solid geometric shapes (triangle, square, rectangle, cube, rectangular prism) according to the number of shape of faces, and the number of edges and vertices.	x	x	x					
2.4.3	Investigate and predict the result of putting together and taking apart two-and three-dimensional shapes.	x	x	x	x	x	x		
2.4.4	Identify congruent two-dimensional shapes in any position.	x	x	x					
2.4.5	Recognize geometric shapes and structures in the environment and specify their locations.	x	x	x					
	Standard 5: Measurement								
	<i>Students understand how to measure length, temperature, capacity, weight, and time in standard units.</i>								
2.5.1	Measure and estimate the length to the nearest inch, foot, yard, centimeter, and meter.	x	x	x					
2.5.2	Describe the relationships among inch, foot, and yard. Describe the relationship between centimeter and meter.	x	x	x					
2.5.3	Describe which unit of length is most appropriate in a given situation.	x	x	x					
2.5.4	Estimate area and use a given object to measure the area of other objects.	x	x	x					
2.5.5	Estimate and measure capacity using cups and pints.	x	x	x					
2.5.6	Estimate weight and use a given object to measure the weight of other objects.	x	x	x					
2.5.7	Recognize the need for a fixed unit of weight.	x	x						
2.5.8	Estimate temperature. Read a thermometer in Celsius and Fahrenheit.	x	x	x					
2.5.9	Tell time to the nearest quarter hour, be able to tell five-minute intervals, and know the difference between a.m. and p.m.	x	x	x					
2.5.10	Know relationships of time: seconds in a minute, minutes in an hour, hours in a day, days in a week, and days, weeks, and months in a year.	x							
2.5.11	Find the duration of intervals of time in hours.	x	x	x					
2.5.12	Find the value of a collection of pennies, nickels, dimes, quarters, half-dollars, and dollars.	x	x	x					
	Standard 6: Problem Solving								
	<i>Students make decisions about how to set up a problem.</i>								
	INSPIRE>Kids Click>Science & Math>Math(General)>coolmath4kids>mathgames								
2.6.1	Choose the approach, materials, and strategies to use in solving problems.	x	x	x	x	x	x		
2.6.2	Use tools such as objects or drawings to model problems.	x	x	x	x	x	x		
2.6.3	Explain the reasoning used and justify the procedures selected in solving a problem.	x	x	x	x	x	x		x
2.6.4	Make precise calculations and check the validity of the results in the context of the problem.	x	x	x					
2.6.5	Understand and use connections between two problems.	x	x	x					

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	Grade 3									
	Standard 1: Number Sense									
	<i>Students understand the relationships among numbers, quantities, and place value in whole numbers up to 1,000. They understand the relationship among whole numbers, simple fractions, and decimals.</i>									
3.1.1	Count, read, and write whole number up to 1,000.	x	x	x						
3.1.2	Identify and interpret place value in whole numbers up to 1,000.	x	x	x						
3.1.3	Use words, models, and expanded form to represent numbers up to 1,000.	x	x	x						
3.1.4	Identify any number up to 1,000 in various combinations of hundreds, tens, and ones.	x	x	x	x					
3.1.5	Compare whole numbers up to 1,000 and arrange them in numerical order.	x	x	x						
3.1.6	Round numbers less than 1,000 to the nearest ten and the nearest hundred.	x	x	x						
3.1.7	Identify odd and even number up to 1,000 and describe their characteristics.	x	x	x						
3.1.8	Show equivalent fractions using equal parts.	x	x	x						
3.1.9	Identify and use correct names for numerators and denominators.	x	x	x						
3.1.10	Given a pair of fractions, decide which is larger or smaller by using objects or pictures.	x	x	x						
3.1.11	Given a set of objects or a picture, name and write a decimal to represent tenths and hundredths.	x	x	x						
3.1.12	Given a decimal for tenths, show it as a fraction using a place-value model.	x	x	x						
3.1.13	Interpret data displayed in a circle graph and answer questions about the situation.	x	x	x	x	x	x			
3.1.14	Identify whether everyday events are certain, likely, unlikely, or impossible.	x	x	x	x	x				
3.1.15	Record the possible outcomes for a simple probability experiment.	x	x	x						
	Standard 2: Computation									
	<i>Students solve problems involving addition and subtraction of whole numbers. They model and solve simple problems involving multiplication and division.</i> INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland									
3.2.1	Add and subtract whole numbers up to 1,000 with or without regrouping, using relevant properties of the number system.	x	x	x						
3.2.2	Represent the concept of multiplication as repeated addition	x	x	x						
3.2.3	Represent the concept of division as repeated subtraction, equal sharing, and forming equal groups	x	x	x						

3.2.4	Know and use the inverse relationship between multiplication and division facts, such as $6 \times 7 = 42$, $42 \div 7 = 6$, $7 \times 6 = 42$; $7 \times 6 = 42$; $42 \div 6 = 7$	x	x	x						
3.2.5	Show mastery of multiplication facts for 2, 5, and 10.	x	x	x						
3.2.6	Add and subtract simple fractions with the same denominator.	x	x	x						
3.2.7	Use estimation to decide whether answers are reasonable in addition and subtraction problems.	x	x	x						
3.2.8	Use mental arithmetic to add and subtract with numbers less than 100.	x	x	x						
	Standard 3: Algebra and Functions									
	<i>Students select appropriate symbols, operations, and properties to represent, describe, simplify, and solve simple number and functional relationships.</i>									
3.3.1	Represent relationships of quantities in the form of a numeric expression or equation.	x	x	x						
3.3.2	Solve problems involving numeric equations.	x	x	x	x	x	x			
3.3.3	Choose appropriate symbols for operations and relations to make a number sentence true.	x	x	x						
3.3.4	Understand and use the commutative and associative rules of multiplication.	x	x	x						
3.3.5	Create, describe, and extend number patterns using multiplication.	x	x	x	x	x	x			
3.3.6	Solve simple problems involving a functional relationship between two quantities.	x	x	x	x	x				
3.3.7	Plot and label whole numbers on a number line up to 10.	x	x	x	x	x	x			
	Standard 4: Geometry									
	<i>Students describe and compare the attributes of plane and solid geometric shapes and use their understanding to show relationships and solve problems.</i>									
3.4.1	Identify quadrilaterals as four-sided shapes.	x	x	x						
3.4.2	Identify right angles in shapes and objects and decide whether other angles are greater or less than a right angle.	x	x	x						
3.4.3	Identify, describe, and classify: cube, sphere, prism, pyramid, cone, cylinder.	x	x	x						
3.4.4	Identify common solid objects that are the parts needed to make a more complex solid object.	x	x	x						
3.4.5	Draw a shape that is congruent to another shape.	x	x	x						
3.4.6	Use the terms point, line, and line segment in describing two-dimensional shapes.	x	x	x						
3.4.7	Draw line segments and lines.	x	x	x						
3.4.8	Identify and draw lines of symmetry in geometric shapes (by hand or using technology).	x	x	x				x	x	
3.4.9	Sketch the mirror image reflections of shapes.	x	x	x						
3.4.10	Recognize geometric shapes and their properties in the environment and specify their locations.	x								
	Standard 5: Measurement									
	<i>Students choose and use appropriate units and measurement tools for length, capacity, weight, temperature, time, and money.</i>									
3.5.1	Measure line segments to the nearest half-inch.	x	x	x						
3.5.2	Add units of length that may require regrouping of inches to feet or centimeters to meters.	x	x	x						
3.5.3	Find the perimeter of a polygon.	x	x	x						
3.5.4	Estimate or find the area of shapes by covering them with squares.	x	x	x						
3.5.5	Estimate or find the volume of objects by counting the number of cubes that would fill them.	x	x	x						
3.5.6	Estimate and measure capacity using quarts, gallons, and liters.	x	x	x						
3.5.7	Estimate and measure weight using pounds and kilograms.	x	x	x						
3.5.8	Compare temperatures in Celsius and Fahrenheit.	x	x	x						
3.5.9	Tell time to the nearest minute and find how much time has elapsed.									
3.5.10	Find the value of a collection of coins and dollars. Write amounts less than a dollar using the ¢ symbol and write larger amounts in decimal notation using the \$ symbol.	x	x	x						

3.5.11	Use play or real money to decide whether there is enough money to make a purchase.	x	x	x						
3.5.12	Carry out simple unit conversions within a measurement system (e.g., centimeters to meters, hours to minutes).	x	x	x	x					
	Standard 6: Problem Solving									
	<i>Students make decisions about how to approach problems and communicate their ideas.</i> INSPIRE>Kids Click>Science & Math>Math(General)>coolmath4kids>mathgames									
3.6.1	Analyze problems by identifying relationships, telling relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.	x	x	x	x	x	x			
3.6.2	Decide when and how to break a problem into simpler parts.	x	x	x						
3.6.3	Apply strategies and results from simpler problems to solve more complex problems.	x	x	x	x	x	x			
3.6.4	Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.	x	x	x	x	x	x			x
3.6.5	Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	x	x	x						
3.6.6.	Know and use strategies for estimating results of whole-number addition and subtraction.	x	x	x						
3.6.7	Make precise calculations and check the validity of the results in the context of the problem.	x	x	x						
3.6.8	Decide whether a solution is reasonable in the context of the original situation.	x	x	x						
3.6.9	Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.	x	x	x						

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Grade 4										
	Standard 1: Number Sense									
	Students understand the place value of whole numbers and decimals to two decimal places and how whole numbers and decimals relate to simple fractions.									
4.1.1	Read and write whole numbers up to 1,000,000.	x	x	x						
4.1.2	Identify and write whole numbers up to 1,000,000, given a place-value model.	x	x	x						
4.1.3	Round whole numbers up to 10,000 to the nearest ten, hundred, and thousand.	x	x	x						
4.1.4	Order and compare whole numbers using symbols for "less than" (<), "equal to"(=), and "greater than" (>).	x	x	x						
4.1.5	Rename and rewrite whole numbers as fractions.	x	x	x						
4.1.6	Name and write mixed numbers, using objects or pictures.	x	x	x						
4.1.7	Name and write mixed numbers as improper fractions, using objects or pictures.	x	x	x						
4.1.8	Write tenths and hundredths in decimal and fraction notations. Know the fraction and decimal equivalents for halves and fourths.	x	x	x						
4.1.9	Round two-place decimals to tenths or to the nearest whole number.	x	x	x						
	Standard 2: Computation									
	Students solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among these operations. They extend their use and understanding of whole numbers to the addition and subtraction of simple fractions and decimals. INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland									
4.2.1	Understand and use standard algorithms for addition and subtraction.	x	x	x						
4.2.2	Represent as multiplication any situation involving repeated addition.	x	x	x						
4.2.3	Represent as division any situation involving the sharing of objects or the number of groups of shared objects.	x	x	x						
4.2.4	Demonstrate mastery of the multiplication tables for numbers between 1 and 10 and of the corresponding division facts.	x	x	x						
4.2.5	Use a standard algorithm to multiply numbers up to 100 by numbers up to 10, using relevant properties of the number system.	x	x	x						

4.2.6	Use a standard algorithm to divide numbers up to 100 by numbers up to 10 without remainders, using relevant properties of the number system.	x	x	x						
4.2.7	Understand the special properties of 0 and 1 in multiplication and division.	x	x	x						
4.2.8	Add and subtract simple fractions with different denominators, using objects or pictures.	x	x	x						
4.2.9	Add and subtract decimals (to hundredths), using objects or pictures.	x	x	x						
4.2.10	Use a standard algorithm to add and subtract decimals (to hundredths).	x	x	x						
4.2.11	Know and use strategies for estimating results of any whole-number computations.	x	x	x						
4.2.12	Use mental arithmetic to add or subtract numbers rounded to hundreds or thousands.	x	x	x						
	Standard 3: Algebra and Functions									
	<i>Students use and interpret variables, mathematical symbols, and properties to write and simplify numerical expressions and sentences. They understand relationships among the operations of addition, subtraction, multiplication, and division.</i>									
4.3.1	Use letters, boxes, or other symbols to represent any number in simple expressions, equations, or inequalities.	x	x	x						
4.3.2	Use and interpret formulas to answer questions about quantities and their relationships.	x	x	x	x	x	x			
4.3.3	Understand that multiplication and division are performed before addition and subtraction in expressions without parentheses.	x	x							
4.3.4	Understand that an equation such as $y = 3x + 5$ is a rule for finding a second number when a first number is given.	x	x							
4.3.5	Continue number patterns using multiplication and division.	x	x	x	x	x	x			
4.3.6	Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve problems.	x	x	x						
4.3.7	Relate problems situations to number sentences involving multiplication and division.	x	x	x						
4.3.8	Plot and label whole numbers on a number line up to 100. Estimate positions on the number line.	x	x	x						
	Standard 4: Geometry									
	<i>Students show an understanding of plane and solid geometric objects and use this knowledge to show relationships and solve problems.</i>									
4.4.1	Identify, describe, and draw rays, right angles, acute angles, obtuse angles and straight angles using appropriate mathematical tools and technology.	x	x	x				x	x	
4.4.2	Identify, describe, and draw parallel, perpendicular, and oblique lines using appropriate mathematical tools and technology.	x	x	x				x	x	
4.4.3	Identify, describe and draw parallelograms, rhombuses, and trapezoids, using appropriate mathematical tools and technology.	x	x	x				x	x	
4.4.4	Identify congruent quadrilaterals and give reasons for congruence using sides, angels, parallels and perpendiculars.	x	x	x	x	x	x			
4.4.5	Identify and draw lines of symmetry in polygons.	x	x	x						
4.4.6	Construct cubes and prisms and describe their attributes.	x	x	x	x	x	x			
	Standard 5: Measurement									
	<i>Students understand perimeter and area, as well as measuring volume, capacity, time, and money.</i>									
4.5.1	Measure length to the nearest quarter-inch, eighth-inch and millimeter.	x	x	x						
4.5.2	Subtract units of length that may require renaming of feet to inches or meters to centimeters.	x	x	x						
4.5.3	Know and use formulas for finding the perimeters of rectangles and squares.		x	x						
4.5.4	Know and use formulas for finding the areas of rectangles and squares.	x	x	x						

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	Grade 5									
	Standard 1: Number Sense									
	<i>Students compute with whole numbers, decimals, and fractions and understand the relationship among decimals, fractions, and percents. They understand the relative magnitudes of numbers. They understand prime and composite numbers.</i>									
5.1.1	Convert between numbers in words and numbers in figures, for numbers up to millions and decimals to thousandths.	x	x	x						
5.1.2	Round whole numbers and decimals to any place value.	x	x	x						
5.1.3	Arrange in numerical order and compare whole numbers or decimals to two decimal places by using the symbols for less than (<), equals (=), and greater than (>).	x	x	x						
5.1.4	Interpret percents as a part of a hundred. Find decimal and percent equivalents for common fractions and explain why they represent the same value.	x	x	x	x	x	x			
5.1.5	Explain different interpretations of fractions: as parts of a whole, parts of a set, and division of whole numbers by whole numbers.	x	x	x						
5.1.6	Describe and identify prime and composite numbers.	x	x	x						
5.1.7	Identify on a number line the relative position of simple positive fractions, positive mixed numbers, and positive decimals.	x	x	x						
	Standard 2: Computation									
	<i>Students solve problems involving multiplication and division of whole numbers and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals.</i> INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland									
5.2.1	Solve problems involving multiplication and division of any whole numbers.	x	x	x						
5.2.2	Add and subtract fractions (including mixed numbers) with different denominators.	x	x	x						
5.2.3	Use models to show an understanding of multiplication and division of fractions.	x	x	x						
5.2.4	Multiply and divide fractions to solve problems.	x	x	x						
5.2.5	Add and subtract decimals and verify the reasonableness of the results.	x	x	x						
5.2.6	Use estimation to decide whether answers are reasonable in addition, subtraction, multiplication, and division problems.	x	x	x						

5.2.7	Use mental arithmetic to add or subtract simple decimals.	x	x	x						
	Standard 3: Algebra and Functions									
	<i>Students use variables in simple expressions, compute the value of an expression for specific values of the variable, and plot and interpret the results. They use two-dimensional coordinate grids to represent points and graph lines.</i>									
5.3.1	Use a variable to represent an unknown number.	x	x	x						
5.3.2	Write simple algebraic expressions in one or two variables and evaluate them by substitution.	x	x	x						
5.3.3	Use the distributive property in numerical equations and expressions.	x	x	x						
5.3.4	Identify and graph ordered pairs of positive numbers.	x	x	x						
5.3.5	Find ordered pairs (positive numbers only) that fit a linear equation, graph the ordered pairs, and draw the line they determine.	x	x	x	x	x	x			
5.3.6	Understand that the length of a horizontal line segment on a coordinate plane equals the difference between the x -coordinates and that the length of a vertical line segment on a coordinate plane equals the difference between the y -coordinates.	x	x							
5.3.7	Use information taken from a graph or equation to answer questions about a problem situation.	x	x	x						
	Standard 4: Geometry									
	<i>Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.</i>									
5.4.1	Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, triangles and circles by using appropriate tools (e.g. ruler, compass, protractor, appropriate technology and media tools.)	x	x	x				x	x	
5.4.2	Identify, describe, draw, and classify triangles as equilateral, isosceles, scalene, right, acute, obtuse, and equiangular.	x	x	x						
5.4.3	Identify congruent triangles and justify your decisions by referring to sides and angles.	x	x	x	x	x	x			
5.4.4	Identify, describe, draw, and classify polygons, such as pentagons and hexagons.	x	x	x						
5.4.5	Identify and draw the radius and diameter of a circle and understand the relationship between the radius and diameter.	x	x	x						
5.4.6	Identify shapes that have reflection and rotational symmetry.	x	x	x						
5.4.7	Understand that 90° , 180° , 270° , and 360° are associated with $1/4$, $1/2$, $3/4$, and full turns, respectively.	x	x							
5.4.8	Construct prisms and pyramids using appropriate materials.	x	x	x	x	x	x		x	
5.4.9	Given a picture of a three-dimensional object, build the object with blocks.	x	x	x	x	x	x			
	Standard 5: Measurement									
	<i>Students understand and compute the areas and volumes of simple objects, as well as measuring weight, temperature, time, and money.</i>									
5.5.1	Understand and apply the formulas for the area of a triangle, parallelogram, and trapezoid.	x	x	x						
5.5.2	Solve problems involving perimeters and areas of rectangles, triangles, parallelograms, and trapezoids, using appropriate units.	x	x	x						
5.5.3	Use formulas for area of rectangles and triangles to find the area of complex shapes by dividing them into basic shapes.	x	x	x						
5.5.4	Find the surface area and volume of rectangular solids using appropriate units.	x	x	x						
5.5.5	Understand and use the smaller and larger units for measuring weight (ounce, gram, and ton) and their relationship to pounds and kilograms.	x	x	x						
5.5.6	Compare temperatures in Celsius and Fahrenheit, knowing that the freezing point of water is 0°C and 32°F and that the boiling point is 100°C and 212°F .	x	x	x						
5.5.7	Add and subtract with money in decimal notation.	x	x	x						

	Standard 6: Data Analysis and Probability								
	<i>Students collect, display, analyze, compare, and interpret data sets. They use the results of probability experiments to predict future events.</i>								
5.6.1	Explain which types of display are appropriate for various sets of data.	x	x	x					x
5.6.2	Find the mean, median, mode, and range of a set of data and describe what each does, and does not tell, about the data set.	x	x	x					
5.6.3	Understand the probability can take any value between 0 and 1, events that are not going to occur have probability 0, events certain to occur have probability 1, and more likely events have a higher probability than less likely events.	x	x	x					
5.6.4	Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4, 3/4).	x	x	x	x	x	x		x
	Standard 7: Problem Solving								
	<i>Students make decisions about how to approach problems and communicate their ideas.</i> INSPIRE>Kid Links>Math for Elementary School Kids>teachrkids								
5.7.1	Analyze problems by identifying relationships, telling relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.	x	x	x	x	x	x		
5.7.2	Decide when and how to break a problem into simpler parts.	x	x	x					
5.7.3	Apply strategies and results from simpler problems to solve more complex problems.	x	x	x					
5.7.4	Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.	x	x	x					x
5.7.5	Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	x	x	x					
5.7.6	Know and apply appropriate methods for estimating results of rational-number computations.	x	x	x					
5.7.7	Make precise calculations and check the validity of the results in the context of the problem.	x	x	x					
5.7.8	Decide whether a solution is reasonable in the context of the original situation.	x	x	x					
5.7.9	Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.	x	x	x					

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		ACCESSES INFORMATION	EVALUATES INFORMATION	USES INFORMATION	PURSUES INFORMATION	APPRECIATES INFORMATION	GENERATES KNOWLEDGE	RECOGNIZES IMPORTANCE OF INFO TO DEMOCRATIC SOCIETY	PRACTICES ETHICAL BEHAVIOR	SHARES AND COLLABORATES
Grade 6										
	Standard 1: Number Sense									
	Students compare and order positive and negative integers, decimals, fractions, and mixed numbers. They find multiples and factors.									
6.1.1	Understand and apply the basic concept of negative numbers (e.g., on a number line, in counting, in temperature, in "owing").	x	x	x						
6.1.2	Interpret the absolute value of the number as a distance from zero on a number line, and find the absolute value of real numbers.	x	x	x	x	x	x			
6.1.3	Compare and represent on a number line positive and negative integers, fractions, decimals, and mixed numbers.	x	x	x						
6.1.4	Convert between any two representations of numbers: fractions, decimals, and percents, without the use of a calculator.	x	x	x						
6.1.5	Recognize decimals equivalents for commonly used fractions without the use of a calculator.	x	x	x						
6.1.6	Use models to represent ratios.	x	x	x						
6.1.7	Find the least common multiple and the greatest common factor of whole numbers. Use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction).	x	x	x						
	Standard 2: Computation									
	Students solve problems involving addition, subtraction, multiplication, and division of integers. They solve problems involving fractions, decimals, ratios, proportions, and percentages.									
6.2.1	Add and subtract positive and negative integers.	x	x	x						
6.2.2	Multiply and divide positive and negative integers.	x	x	x						
6.2.3	Multiply and divide decimals.	x	x	x						
6.2.4	Explain how to multiply and divide positive fractions and perform the calculations.	x	x	x						x
6.2.5	Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.	x	x	x						
6.2.6	Interpret and use ratios to show the relative sizes of two quantities. Use the notations: a/b, a to b, a:b.	x	x	x	x	x	x			
6.2.7	Understand proportions and use them to solve problems.		x	x						

6.2.8	Calculate given percentages of quantities and solve problems involving discounts at sales, interest, earned, and tips.	x	x	x						
6.2.9	Use estimation to decide whether answers are reasonable in decimal problems.	x	x	x						
6.2.10	Use mental arithmetic to add or subtract simple fractions and decimals.	x	x	x						
	Standard 3: Algebra and Functions									
	<i>Students write verbal expressions and sentences as algebraic expressions and equations. They evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results. They investigate geometric relationships and describe them algebraically.</i> http://www.middleschoolhub.org/school/math.cfm									
6.3.1	Write and solve one-step linear equations and inequalities in one variable and check the answers.	x	x	x						
6.3.2	Write and use formulas with up to three variable to solve problems.	x	x	x						
6.3.3	Interpret and evaluate mathematical expressions that use grouping symbols such as parentheses.	x	x	x						
6.3.4	Use parentheses to indicate which operation to perform first when writing expressions containing more than two terms and different operations.	x	x	x						
6.3.5	Use variables in expressions describing geometric quantities.	x	x	x						
6.3.6	Apply the correct order of operations and the properties of real numbers (e.g., identity, inverse, commutative, associative, and distributive properties) to evaluate numerical expressions. Justify each step in the process.	x	x	x						
6.3.7	Identify and graph ordered pairs in the four quadrants of the coordinate plane.	x	x	x						
6.3.8	Solve problems involving linear functions with integer values. Write the equation and graph the resulting ordered pairs of integers on a grid.	x	x	x						
6.3.9	Investigate how a change in one variable relates to a change in a second variable.	x	x	x	x	x	x			
	Standard 4: Geometry									
	<i>Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.</i>									
6.4.1	Identify and draw vertical, adjacent, complementary, and supplementary angles and describe these angle relationships.	x	x	x						
6.4.2	Use the properties of complementary, supplementary, and vertical angles to solve problems involving an unknown angle. Justify solutions.	x	x	x						
6.4.3	Draw quadrilaterals and triangles from given information about them.	x	x	x						
6.4.4	Understand that the sum of the interior angles of any triangle is 180 degrees and the sum of the interior angles of any quadrilateral is 360 degrees. Use this information to solve problems.	x	x	x						
6.4.5	Identify and draw two-dimensional shapes that are similar.	x	x	x						
6.4.6	Draw the translation (slide) and reflection (flip) of shapes.	x	x	x						
6.4.7	Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids.	x	x	x						
	Standard 5: Measurement									
	<i>Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems. They calculate with temperatures and money, and choose appropriate units of measure in other areas.</i> INSPIRE>Links>Kids!>Fact Monster>Math>Money									
6.5.1	Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.	x	x	x						

6.5.2	Understand and use larger units for measuring length by comparing miles to yards and kilometers to meters.	x	x	x						
6.5.3	Understand and use larger units for measuring area by comparing acres and square miles to square yards and square kilometers to square meters.	x	x	x						
6.5.4	Understand the concept of the constant pi as the ratio of the circumference to the diameter of a circle. Develop and use the formulas for the circumference and area of a circle.	x	x	x						
6.5.5	Know common estimates of pi (3.14, 22/7) and use these values to estimate and calculate the circumference and the area of circles. Compare with actual measurements.	x	x	x						
6.5.6	Understand the concept of significant figures and round answers to an appropriate number of significant figures.	x	x	x						
6.5.7	Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area of the objects.	x	x	x	x	x	x			
6.5.8	Use strategies to find the surface area and volume of right prisms and cylinders using appropriate units.	x	x	x	x	x	x			
6.5.9	Use a formula to convert temperatures between Celsius and Fahrenheit.	x	x	x						
6.5.10	Add, subtract, multiply, and divide with money in decimal notation.	x	x	x						
Standard 6: Data Analysis and Probability										
<i>Students compute and analyze statistical measures for data sets. They determine theoretical and experimental probabilities and use them to make predictions about events.</i> INSPIRE >Kidslink>Yahooligans>School_Bell>Math>Games & Puzzles>Mathsyear 2000>Numberland										
6.6.1	Organize and display single-variable data in appropriate graphs and stem-and-leaf plots, and explain which types of graphs are appropriate for various data sets.	x	x	x	x	x	x			x
6.6.2	Make frequency tables for numerical data, grouping the data in different ways to investigate how different groupings describe the data. Understand and find relative and cumulative frequency for a data set. Use histograms of the data and of the relative frequency distribution, and a broken line graph for cumulative frequency to interpret the data.	x	x	x	x	x	x			
6.6.3	Compare the mean, median, and mode for a set of data and explain which measure is most appropriate in a given context.	x	x	x						
6.6.4	Show all possible outcomes for compound events in an organized way and find the theoretical probability of each outcome.	x	x	x						
6.6.5	Use data to estimate the probability of future events.	x	x	x						
6.6.6	Understand and represent probabilities as ratios, measures of relative frequency, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable.	x	x	x						
Standard 7: Problem Solving										
<i>Students make decisions about how to approach problems and communicate their ideas.</i>										
6.7.1	Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	x	x	x	x	x	x			
6.7.2	Make and justify mathematical conjectures based on a general description of a mathematical question or problem.	x	x	x	x	x	x			
6.7.3	Decide when and how to break a problem into simpler parts.	x	x	x						
6.7.4	Apply strategies and results from simpler problems to solve more complex problems.	x	x	x						
6.7.5	Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.	x	x	x						x

6.7.6	Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	x	x	x						
6.7.7	Select and apply appropriate methods for estimating results of rational-number computations.	x	x	x						
6.7.8	Use graphing to estimate solutions and check the estimates with analytic approaches.	x	x	x						
6.7.9	Make precise calculations and check the validity of the results in the context of the problem.	x	x	x						
6.7.10	Decide whether a solution is reasonable in the context of the original situation.	x	x	x						
6.7.11	Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.	x	x	x						

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Grade 7										
	Standard 1: Number Sense									
	Students understand and use scientific notation and square roots. They convert between fractions and decimals.									
7.1.1	Read, write, compare and solve problems using whole numbers in scientific notation.	x	x	x	x	x	x			
7.1.2	Compare and order rational and common irrational numbers and place them on a number line.	x	x	x						
7.1.3	Identify rational and common irrational numbers from a list.	x	x	x						
7.1.4	Understand and compute whole number powers of whole numbers.	x	x	x						
7.1.5	Find the prime factorization of whole numbers and write the results using exponents.	x	x	x						
7.1.6	Understand and apply the concept of square root.	x	x	x						
7.1.7	Convert terminating decimals into reduced fractions.	x	x	x						
	Standard 2: Computation									
	Students solve problems involving integers, fractions, decimals, ratios, and percentages.									
7.2.1	Solve addition, subtraction, multiplication, and division problems that use integers, fractions, and decimals, and combinations of the four operations.	x	x	x						
7.2.2	Calculate the percentage increase and decrease of a quantity.	x	x	x						
7.2.3	Solve problems that involve discounts, markups, and commissions.	x	x	x	x	x	x			
7.2.4	Use estimation to decide whether answers are reasonable in problems involving fractions and decimals.	x	x	x						
7.2.5	Use mental arithmetic to compute with simple fractions, decimals, and powers.	x	x	x						
	Standard 3: Algebra and Functions									
	Students express quantitative relationships using algebraic terminology, expressions, equations, inequalities, and graphs. http://middleschoolhub.org/school/math.cfm									
7.3.1	Use variables and appropriate operations to write an expression, a formula, an equation, or an inequality that represents a verbal description.	x	x	x						
7.3.2	Write and solve two-step linear equations and inequalities in one variable and check the answers.	x	x	x						
7.3.3	Use correctly algebraic terminology such as variable, equation, term, coefficient, inequality, expression,, and constant.	x	x	x						

7.3.4	Evaluate numerical expressions and simplify algebraic expressions by applying the correct order of operations and the properties of rational numbers (e.g., identity, inverse, commutative, associative, distributive). Justify each step in the process.	x	x	x						
7.3.5	Solve an equation or formula with two variables for a particular variable.	x	x	x						
7.3.6	Define slope as vertical change per unit of horizontal change and recognize that a straight lines has constant slope or rate of change.	x	x	x						
7.3.7	Find the slope of a line from its graph.	x	x	x						
7.3.8	Draw the graph of a line given the slope and one point on the line, or two points on the line.	x	x	x						
7.3.9	Identify functions as linear or nonlinear and examine their characteristics in tables, graphs, and equations.	x	x							
7.3.10	Identify and describe situations with constant or varying rates of change and know that a constant rate of change describes a linear function.	x	x	x						
	Standard 4: Geometry									
	<i>Students deepen their understanding of plane and solid geometric shapes by constructing shapes that meet given conditions and by identifying attributes of shapes.</i>									
7.4.1	Understand coordinate graphs and use them to plot simple shapes, find lengths and areas related to the shapes, and find images under translations (slides), rotations (turns), and reflections (flips).	x	x	x						
7.4.2	Understand that transformation such as slides, turns and flips preserve the length of segments, and that figures that result from slides, turns and flips are congruent to the original figures.	x	x							
7.4.3	Know and understand the Pythagorean Theorem and use it to find the length of the missing side of a right triangle and the lengths of other line segments. Use direct measurements to test conjectures about triangles.	x	x	x	x	x	x			
7.4.4	Construct two-dimensional patterns (nets) for three-dimensional patterns objects, such as right prisms, pyramids, cylinders, and cones.	x	x	x						
	Standard 5: Measurement									
	<i>Students compare units of measure and use similarity to solve problems. They compute the perimeter, areas, and volume of common geometric objects and use the results to find measures of less regular objects.</i>									
7.5.1	Compare lengths, areas, volumes, weights, capacities, times, and temperatures within measurement systems.	x	x	x						
7.5.2	Use experimentation and modeling to visualize similarity problems. Solve problems using similarity.	x	x	x	x	x	x	x	x	
7.5.3	Read and create drawings made to scale, construct scale models, and solve problems related to scale.	x	x	x						
7.5.4	Use formulas for finding the perimeter and area of basic two-dimensional shapes and the surface area and volume of basic three-dimensional shapes, including rectangles, parallelograms, trapezoids, triangles, circles, right prisms, and cylinders	x	x	x						
7.5.5	Estimate and compute the area of more complex or irregular two-dimensional shapes by breaking them down into more basic shapes.	x	x	x						
7.5.6	Use objects and geometry modeling tools to compute the surface area of the faces and the volume of a three-dimensional object built from rectangular solids.	x	x	x					x	

	Standard 6: Data Analysis and Probability								
	<i>Students collect, organize, and represent data sets and identify relationships among variables within a data set by hand and through the use of electronic spreadsheet software program. They determine probabilities and use them to make predictions about events.</i> INSPIRE>Yahooligans>School_Bell>Math>Real World Math>USDA-NASS Kids								
7.6.1	Analyze, interpret, and display data in appropriate bar, line, and circle graphs and stem-and-leaf plots, and justify the choice of display.	x	x	x	x	x	x		x
7.6.2	Make predictions from statistical data.	x	x	x	x	x	x	x	
7.6.3	Describe how additional data, particularly outliers, added to a data set may affect the mean, median, and mode.	x	x	x	x	x	x		
7.6.4	Analyze data displays, including ways that they can be misleading. Analyze ways in which the wording of questions can influence survey results.	x	x	x	x	x	x	x	x
7.6.5	Know that if P is the probability of an event occurring, then $1-P$ is the probability of that event not occurring.	x	x						
7.6.6	Understand that the probability of either one or the other of two disjoint events occurring is the sum of the two individual probabilities.	x	x						
7.6.7	Find the number of possible arrangements of several objects using a tree diagram.	x	x	x					
	Standard 7: Problem Solving								
	<i>Students make decisions about how to approach problems and communicate their ideas.</i> INSPIRE>Links>Kids!> Fact Monster>Math>Money								
7.7.1	Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information and observing patterns.	x	x	x	x	x	x		
7.7.2	Make and justify mathematical conjectures based on a general description of a mathematical question or problem.	x	x	x	x	x	x		
7.7.3	Decide when and how to break a problem into simpler parts.	x	x	x					
7.7.4	Apply strategies and results from simpler problems to solve more complex problems.	x	x	x					
7.7.5	Make and test conjectures by using inductive reasoning.	x	x	x	x	x	x		
7.7.6	Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.	x	x	x	x	x	x		x
7.7.7	Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	x							
7.7.8	Select and apply appropriate methods for estimating results of rational-number computations.	x	x	x					
7.7.9	Use graphing to estimate solutions and check the estimates with analytic approaches.	x	x	x	x	x	x		
7.7.10	Make precise calculations and check the validity of the results in the context of the problem.	x	x	x	x	x	x		
7.7.11	Decide whether a solution is reasonable in the context of the original situation.	x	x	x	x	x	x		
7.7.12	Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.	x	x	x	x	x	x		

8.3.2	Solve systems of two linear equations using the substitution method and identify approximate solutions graphically.	x	x	x						
8.3.3	Interpret positive integer powers as repeated multiplication and negative integer powers as repeated division or multiplication by the multiplicative inverse.	x	x	x						
8.3.4	Use the correct order of operations to find the values of algebraic expressions involving powers.	x	x	x						
8.3.5	Identify and graph linear functions, and identify lines with positive and negative slope.	x	x	x						
8.3.6	Find the slope of a linear function given the equation and write the equation of a line given the slope and any point on the line	x	x	x						
8.3.7	Demonstrate an understanding of rate as a measure of one quantity with respect to another quantity.	x	x	x						
8.3.8	Demonstrate an understanding of the relationships among tables, equations, verbal expressions, and graphs of linear functions.	x	x	x						
8.3.9	Represent simple quadratic functions using verbal descriptions, tables, graphs and formulas, and translate among these representations.	x	x	x						
8.3.10	Graph functions of the form $y=nx^2$, and $y = nx^3$ and describe the similarities and differences in the graphs.	x	x	x	x	x	x			
	Standard 4: Geometry									
	<i>Students deepen their understanding of plane and solid geometric shapes and properties by constructing shapes that meet given conditions, by identifying attributes of shapes, and by applying geometric concepts to solve problems.</i>									
8.4.1	Identify and describe basic properties of geometric shapes: altitudes, diagonals, angle bisectors, perpendicular bisectors, central angles, radii, diameters, and chords of circles.	x	x	x						
8.4.2	Perform simple constructions such as bisectors of segments and angles, copies of segments and angles, and perpendicular segments. Describe and justify the constructions.	x	x	x	x	x	x			
8.4.3	Identify properties of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more figures intersect in a plane or in space.	x	x	x						
8.4.4	Draw the translation (slide) rotation (turn), reflection (flip), and dilation (stretches and shrinks) of shapes.	x	x	x						
8.4.5	Use the Pythagorean Theorem and its converse to solve problems in two and three dimensions.	x	x	x	x	x	x			
	Standard 5: Measurement									
	<i>Students convert between units of measure and use rates and scale factors to solve problems. They compute the perimeter, area, and volume of geometric objects. They investigate how perimeter, area, and volume are affected by changes of scale.</i> INSPIRE>Links>Kids!>FactMonster>Math									
8.5.1	Convert common measurements for length, area, volume, weight, capacity, and time to equivalent measurements within the same system.	x	x	x						
8.5.2	Solve simple problems involving rates and derived measurements for such attributes as velocity and density.	x	x	x	x	x	x			
8.5.3	Solve problems involving scale factors, area, and volume using ratio and proportion.	x	x	x	x	x	x			
8.5.4	Use formulas for finding the perimeter and area of basic two-dimensional shapes and the surface area and volume of basic three-dimensional shapes, including rectangles, parallelograms, trapezoids, triangles, circles, prisms, cylinders, spheres, cones, and pyramids.	x	x	x						
8.5.5	Estimate and compute the area and volume of irregular two- and three-dimensional shapes by breaking the shapes down into more basic geometric objects.	x	x	x						

	Standard 6: Data Analysis and Probability								
	<i>Students collect, organize, represent, and interpret relationships in data sets that have one or more variables. They determine probabilities and use them to make predictions about events.</i>								
8.6.1	Identify claims based on statistical data and, in simple cases, evaluate the reasonableness of the claims. Design a study to investigate the claim.	x	x	x	x	x	x	x	x
8.6.2	Identify different methods of selecting samples, analyzing the strengths and weaknesses of each method, and the possible bias in a sample or display.	x	x	x	x	x			
8.6.3	Understand the meaning of, and be able to identify or compute the minimum value, the lower quartile, the median, the upper quartile, the interquartile range, and the maximum value of a data set.	x	x	x	x	x	x		
8.6.4	Analyze, interpret, and display single- and two-variable data in appropriate bar, line and circle graphs, stem-and-leaf plots and box-and-whisker plots, and explain which types of display are appropriate for various data sets.	x	x	x	x	x		x	
8.6.5	Represent two-variable data with a scatterplot on the coordinate plane and describe how the data points are distributed. If the pattern appears to be linear, draw a line that appears to best fit the data, and write the equation of that line.	x	x	x					
8.6.6	Understand and recognize equally likely events.	x	x	x					
8.6.7	Find the number of possible arrangements of several objects by using the Basic Counting Principle.	x	x	x					
	Standard 7: Problem Solving								
	<i>Students make decisions about how to approach problems and communicate their ideas.</i> INSPIRE>Links>Kids!> Kids Click>click on the G for subject search>Geometry>click on any thinkquest>math>fractals								
8.7.1	Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	x	x	x	x	x	x		
8.7.2	Make and justify mathematical conjectures based on a general description of a mathematical question or problem.	x	x	x	x	x			
8.7.3	Decide when and how to break a problem into simpler parts.	x	x	x					
8.7.4	Apply strategies and results from simpler problems to solve more complex problems.	x	x	x	x	x			
8.7.5	Make and test conjectures by using inductive reasoning.	x	x	x	x	x			
8.7.6	Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.	x	x	x					
8.7.7	Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	x	x	x	x	x			
8.7.8	Select and apply appropriate methods for estimating results of rational-number computations.	x	x	x					
8.7.9	Use graphing to estimate solutions and check the estimates with analytic approaches.	x	x	x					
8.7.10	Make precise calculations and check the validity of the results in the context of the problem.	x	x	x	x	x			
8.7.11	Decide whether a solution is reasonable in the context of the original situation.	x	x	x	x	x			
8.7.12	Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.	x	x	x	x	x			

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Algebra I										
	Standard 1: Operations with Real Numbers									
	Students simplify and compare expressions. They use rational exponents, and simply square roots. INSPIRE>kidslink>Kids Click>Math>Algebra>Intro to Algebra									
A1.1.1	Compare real number expressions.	x	x	x						
A1.1.2	Simplify square roots using factors.	x	x	x						
A1.1.3	Understand and use the distributive, associative, and commutative properties.	x	x	x						
A1.1.4	Use the laws of exponents for rations exponents.	x	x	x						
A1.1.5	Use dimensional (unit) analysis to organize conversions and computations.	x	x	x						
	Standard 2: Linear Equations and Inequalities									
	Students solve linear equations and inequalities in one variable. They solve word problems that involve linear equations, inequalities, or formulas. INSPIRE>Yahooligans>School Bell>Math>Algebra>Math tour									
A1.2.1	Solve linear equations.	x	x	x						
A1.2.2	Solve equations and formulas for a specified variable.	x	x	x						
A1.2.3	Find solution sets of linear inequalities when possible numbers are given for the variable.	x	x	x						
A1.2.4	Solve linear inequalities using properties of order.	x	x	x						
A1.2.5	Solve combined linear inequalities.	x	x	x						
A1.2.6	Solve word problems that involve linear equations, formulas, and inequalities.	x	x	x	x	x	x	x		
	Standard 3: Relations and Functions									
	Students sketch and interpret graphs representing given situations. They understand the concept of a function and analyze the graphs of functions. INSPIRE>Great Sites for Kids>Mathematics>Math League Help>Using Data And Statistics									
A1.3.1	Sketch a reasonable graph for a given relationship.	x	x	x	x	x	x			
A1.3.2	Interpret a graph representing a given situation.	x	x	x	x	x	x			
A1.3.3	Understand the concept of a function, decide if a given relation is a function, and link equations to functions.	x	x	x						
A1.3.4	Find the domain and range of a relation.	x	x	x						

	Standard 4: Graphing Linear Equations and Inequalities								
	<i>Students graph linear equations and inequalities in two variables. They write equations of lines and find and use the slope and y-intercept of lines. They use linear equations to model real data.</i> INSPIRE>Great Sites for Kids>Mathematics>Math League Help>Using Data And Statistics								
A1.4.1	Graph a linear equation.	x	x	x					
A1.4.2	Find the slope, x -intercept and y -intercept of a line given its graph, its equation, or two points on the line.	x	x	x					
A1.4.3	Write the equation of a line in slope-intercept form. Understand how the slope and y -intercept of the graph are related to the equation.	x	x	x					
A1.4.4	Write the equation of a line given appropriate information.	x	x	x					
A1.4.5	Write the equation of a line that models a data set and use the equation (or the graph of the equation) to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.	x	x	x					
A1.4.6	Graph a linear inequality in two variables.	x	x	x					
	Standard 5: Pairs of Linear Equations and Inequalities								
	<i>Students solve pairs of linear equations using graphs and using algebra. They solve pairs of linear inequalities using graphs. They solve word problems involving pairs of linear equations.</i> INSPIRE> Kids Click>Science & Math>Math Problems> Go Math								
A1.5.1	Use a graph to estimate the solution of a pair of linear equations in two variables.	x	x	x					
A1.5.2	Use a graph to find the solution set of a pair of linear inequalities in two variables.	x	x	x					
A1.5.3	Understand and use the substitution method to solve a pair of linear equations in two variables.	x	x	x					
A1.5.4	Understand and use the addition or subtraction method to solve a pair of linear equations in two variables.	x	x	x					
A1.5.5	Understand and use multiplication with the addition or subtraction method to solve a pair of linear equations in two variables.	x	x	x					
A1.5.6	Use pairs of linear equations to solve word problems.	x	x	x	x	x			
	Standard 6: Polynomials								
	<i>Students add, subtract, multiply, and divide polynomials. They factor quadratics.</i>								
A1.6.1	Add and subtract polynomials.	x	x	x					
A1.6.2	Multiply and divide monomials.	x	x	x					
A1.6.3	Find powers and roots of monomials (only when the answer has an integer exponent).	x	x	x					
A1.6.4	Multiply polynomials.	x	x	x					
A1.6.5	Divide polynomials by monomials.	x	x	x					
A1.6.6	Find a common monomial factor in a polynomial.	x	x	x					
A1.6.7	Factor the difference of two squares and other quadratics.	x	x	x					
A1.6.8	Understand and describe the relationships among the solutions of an equation, the zeros of a function, the x -intercepts of a graph, and the factors of a polynomial expression.	x	x	x					
	Standard 7: Algebraic Fractions								
	<i>Students simplify algebraic ratios and solve algebraic proportions.</i> INSPIRE> Kids Click>Science & Math>Math Problems> Go Math								
A1.7.1	Simplify algebraic ratios.	x	x	x					
A1.7.2	Solve algebraic proportions.	x	x	x					

	Standard 8: Quadratic, Cubic, and Radical Equations								
	<i>Students graph and solve quadratic and radical equations. They graph cubic equations.</i> http://www.univie.ac.at/future.media/moe/galerie/gleich/gleich.html								
A1.8.1	Graph quadratic, cubic, and radical equations.	x	x	x					
A1.8.2	Solve quadratic equations by factoring.	x	x	x					
A1.8.3	Solve quadratic equations in which a perfect square equals a constant.	x	x	x					
A1.8.4	Complete the square to solve quadratic equations.	x	x	x					
A1.8.5	Derive the quadratic formula by completing the square.	x	x	x					
A1.8.6	Solve quadratic equations by using the quadratic formula.	x	x	x					
A1.8.7	Use quadratic equations to solve word problems.	x	x	x	x	x			
A1.8.8	Solve equations that contain radical expressions.	x	x	x					
A1.8.9	Use graphing technology to find approximate solutions of quadratic and cubic equations.	x	x	x				x	x
	Standard 9: Mathematical Reasoning and Problem Solving								
	<i>Students use a variety of strategies to solve problems.</i>								
A1.9.1	Use a variety of problem solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.	x	x	x	x	x	x		
A1.9.2	Decide whether a solution is reasonable in the context of the original situation.	x	x	x	x	x	x		
	<i>Students develop and evaluate mathematical arguments and proofs.</i>								
A1.9.3	Use the properties of the real number system and the order of operations to justify the steps of simplifying functions and solving equations.	x	x	x	x	x	x		
A1.9.4	Understand that the logic of equation solving begins with the assumption that the variable is a number that satisfies the equation, and that the steps taken when solving equations create new equations that have, in most cases, the same solution set as the original. Understand that similar logic applies to solving systems of equations simultaneously.	x	x	x	x	x	x		
A1.9.5	Decide whether a given algebraic statement is true always, sometimes, or never (statements involving linear or quadratic expressions, equations, or inequalities).	x	x	x					
A1.9.6	Distinguish between inductive and deductive reasoning, identifying and providing examples of each.	x	x	x					
A1.9.7	Identify the hypothesis and conclusion in a logical deduction.	x	x	x					
A1.9.8	Use counterexamples to show that statements are false, recognizing that a single counterexample is sufficient to prove a general statement false.	x	x	x	x	x	x		

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Algebra II										
	Standard 1: Relations and Functions									
	Students graph relations and functions and find zeros. They use function notation and combine functions by composition. They interpret functions in given situations. http://www.coolmath.com/home.htm									
A2.1.1	Recognize and graph various types of functions, including polynomial, rational, and algebraic functions.	x								
A2.1.2	Use function notation. Add, subtract, multiply, and divide pairs of functions.	x	x	x						
A2.1.3	Understand composition of functions and combine functions by composition.	x	x							
A2.1.4	Graph relations and functions with and without graphing technology.	x	x	x				x	x	
A2.1.5	Find the zeros of a function.	x	x	x						
A2.1.6	Solve an inequality by examining the graph.	x	x	x						
A2.1.7	Graph functions defined piece-wise.	x	x	x						
A2.1.8	Interpret given situations as functions in graphs, formulas, and words.	x	x	x	x	x	x			
	Standard 2: Linear and Absolute Value Equations and Inequalities									
	<i>Students solve systems of linear equations and inequalities and use them to solve word problems. They model data with linear equations.</i>									
A2.2.1	Graph absolute value equations and inequalities.	x	x	x						
A2.2.2	Use substitution, elimination, and matrices to solve systems of two or three linear equations in two or three variables.	x	x	x						
A2.2.3	Use systems of linear equations and inequalities to solve word problems.	x	x	x	x	x	x	x	x	x
A2.2.4	Find a linear equation that models a data set using the median fit method and use the model to make predictions.	x	x	x	x	x	x			
	Standard 3: Quadratic Equations and Functions									
	<i>Students solve quadratic equations, including the use of complex numbers. They interpret maximum and minimum values of quadratic functions. They solve equations that contain square roots.</i>									
A2.3.1	Define complex numbers and perform basic operations with them.	x	x	x						
A2.3.2	Understand how real and complex numbers are related, including plotting complex numbers as points in the plane.	x	x	x						

A2.3.3	Solve quadratic equations in the complex number system.	x	x	x						
A2.3.4	Graph quadratic functions. Apply transformations to quadratic functions. Find and interpret the zeros and maximum or minimum value of quadratic functions.	x	x	x						
A2.3.5	Solve word problems using quadratic equations.	x	x	x	x	x	x	x		x
A2.3.6	Solve equations that contain radical expressions.	x	x	x						
A2.3.7	Solve pairs of equations, one quadratic and one linear, or both quadratic.	x	x	x						
	Standard 4: Conic Sections									
	<i>Students write equations of conic sections and draw their graphs.</i>									
A2.4.1	Write the equations of conic sections (circle, ellipse, parabola, and hyperbola).	x	x	x						
A2.4.2	Graph conic sections.	x	x	x						
	Standard 5: Polynomials									
	<i>Students use the binomial theorem, divide and factor polynomials, and solve polynomial equations.</i>									
A2.5.1	Understand the binomial theorem and use it to expand binomial expressions raised to positive integer powers.	x	x	x						
A2.5.2	Divide polynomials by others of lower degree.	x								
A2.5.3	Factor polynomials completely and solve polynomial equations by factoring.	x	x	x						
A2.5.4	Use graphing technology to find approximate solutions for polynomial equations.	x	x	x				x	x	
A2.5.5	Use polynomial equations to solve word problems.	x	x	x	x	x				
A2.5.6	Write a polynomial equation given its solutions.	x	x	x						
A2.5.7	Understand and describe the relationships among the solutions of an equation, the zeros of a function, the x -intercepts of a graph, and the factors of a polynomial expression.	x	x	x						
	Standard 6: Algebraic Fractions									
	<i>Students use negative and fractional exponents. They simplify algebraic fractions and solve equations involving algebraic fractions. They solve problems of direct, inverse, and joint variation.</i>									
A2.6.1	Understand and use negative and fractional exponents.	x	x	x						
A2.6.2	Add, subtract, multiply, divide, and simplify algebraic fractions.	x	x	x						
A2.6.3	Simplify complex fractions.	x	x	x						
A2.6.4	Solve equations involving algebraic fractions.	x	x	x						
A2.6.5	Solve word problems involving fractional equations.	x	x	x	x	x				
A2.6.6	Solve problems of direct, inverse, and point variations.	x	x	x						
	Standard 7: Logarithmic and Exponential Functions									
	<i>Students graph exponential functions and relate them to logarithms. They solve logarithmic and exponential equations and inequalities. They solve word problems using exponential functions.</i> http://id.mind.net/~zona/mmts/functionInstitute/functionInstitute.html									
A2.7.1	Graph exponential functions.	x	x	x						
A2.7.2	Prove simple laws of logarithms.	x	x	x	x	x				
A2.7.3	Understand and use the inverse relationship between exponents and logarithms.	x	x	x						
A2.7.4	Solve logarithmic and exponential equations and inequalities.	x	x	x						
A2.7.5	Use the definition of logarithms to convert logarithms from one base to another.	x	x	x						
A2.7.6	Use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.	x	x	x						

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		ACCESSES INFORMATION	EVALUATES INFORMATION	USES INFORMATION	PURSUES INFORMATION	APPRECIATES INFORMATION	GENERATES KNOWLEDGE	RECOGNIZES IMPORTANCE OF INFO TO DEMOCRATIC SOCIETY	PRACTICES ETHICAL BEHAVIOR	SHARES AND COLLABORATES
Geometry										
	Standard 1: Points, Lines, Angles, and Planes									
	Students find lengths and midpoints of lines. They describe and use parallel and perpendicular lines. They find slopes and equations of lines.									
G.1.1	Find the lengths and midpoints of line segments in one- or two-dimensional coordinate systems.	x								
G.1.2	Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass, explaining and justifying the process used.	x	x	x	x	x	x	x		x
G.1.3	Understand and use the relationships between special pairs of angles formed by parallel lines and transversals.	x	x	x						
G.1.4	Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.	x	x	x						
	Standard 2: Polygons									
	Students identify and describe polygons, and measure interior and exterior angles. They use congruence, similarity, symmetry, tessellations, and transformations. They find measures of sides, perimeters, and areas. http://www.yahooligans.com/School_Bell/Math/Geometry/Tessellations/									
G.2.1	Identify and describe convex, concave, and regular polygons.	x	x	x						
G.2.2	Find measures of interior and exterior angles of polygons, justifying the method used.	x	x	x						
G.2.3	Use properties of congruent and similar polygons to solve problems.	x	x	x						
G.2.4	Apply transformations (slides, flips, turns, expansions, and contractions) to polygons in order to determine congruence, similarity, symmetry, and tessellations. Know that images formed by slides, flips, and turns are congruent to the original image.	x	x	x						
G.2.5	Find and use measures of sides, perimeters, and areas of polygons, and relate these measures to each other using formulas.	x	x	x						
G.2.6	Use coordinate geometry to prove properties of polygons such as regularity, congruence, and similarity.	x	x	x						
	Standard 3: Quadrilaterals									
	Students identify and describe simple quadrilaterals. They use congruence and similarity. They find measures of sides, perimeters, and areas.									
G.3.1	Describe, classify, and understand relationships among the quadrilaterals square, rectangle, rhombus, parallelogram, trapezoid, and kite.	x	x	x						
G.3.2	Use properties of congruent and similar quadrilaterals to solve problems involving lengths and areas.	x	x	x						

G.3.3	Find and use measures of sides, perimeters, and areas of quadrilaterals, and relate these measures to each other using formulas.	x	x	x						
G.3.4	Use coordinate geometry to prove properties of quadrilaterals such as regularity, congruence, and similarity.	x	x	x						
	Standard 4: Triangles									
	<i>Students identify and describe types of triangles. They identify and draw altitudes, medians, and angle bisectors. They use congruence and similarity. They find measure of sides, perimeters, and areas. They apply inequality theorems.</i>									
G.4.1	Identify and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.	x	x	x						
G.4.2	Define, identify, and construct altitudes, medians, angle bisectors, and perpendicular bisectors.	x	x	x						
G.4.3	Construct triangles congruent to given triangles.	x	x	x						
G.4.4	Use properties of congruent and similar triangles to solve problems involving lengths and areas.	x	x	x	x	x	x	x		x
G.4.5	Prove and apply theorems involving segments divided proportionally.	x	x	x	x	x	x			
G.4.6	Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.	x	x	x	x	x	x			
G.4.7	Find and use measures of sides, perimeter, and areas of triangles, and relate these measures to each other using formulas.	x	x	x						
G.4.8	Prove, understand, and apply the inequality theorems: triangle inequality, inequality in one triangle, and hinge theorem.	x	x	x	x	x	x			
G.4.9	Use coordinate geometry to prove properties of triangles such as regularity, congruence, and similarity.	x	x	x						
	Standard 5: Right Triangles									
	<i>Students prove the Pythagorean Theorem and use it to solve problems. They define and apply the trigonometric relations sine, cosine, and tangent.</i> INSPIRE>Kids Click>Science & Math>Math(General)>coolmath4kids>Ages13-1000>The Pythagorean Identities									
G.5.1	Prove and use the Pythagorean Theorem.	x	x	x	x	x	x			
G.5.2	State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.	x	x	x						
G.5.3	Use special right triangles (30 - 60 and 45- 45) to solve problems.	x	x	x	x	x	x			
G.5.4	Define and use the trigonometric functions (sine, cosine, tangent, cosecant, secant, cotangent) in terms of angles of right triangles.	x	x	x						
G.5.5	Know and use the relationship $\sin^2 x + \cos^2 x = 1$.	x	x	x						
G.5.6	Solve word problems involving right triangles.	x	x	x	x	x	x	x		x
	Standard 6: Circles									
	<i>Students define ideas related to circles; e.g. radius, tangent. They find measures of angles, lengths, and areas. They prove theorems about circles. They find equations of circles.</i>									
G.6.1	Find the center of a given circle. Construct the circle that passes through three given point (not a straight line).	x	x	x						
G.6.2	Define and identify relationships among: radius, diameter, arc, measure of an arc, chord, secant, and tangent.	x	x							
G.6.3	Prove theorems related to circles.	x	x	x	x	x	x			
G.6.4	Construct tangents to circles, and circumscribe and inscribe circles.	x	x	x						

INDICATOR NUMBER	CORRELATION OF THE INFORMATION LITERACY STANDARDS AND INDIANA'S ACADEMIC STANDARDS FOR MATHEMATICS Release date 2000	ILS 1 ACCESSES INFORMATION	ILS 2 EVALUATES INFORMATION	ILS 3 USES INFORMATION	ILS 4 PURSUES INFORMATION	ILS 5 APPRECIATES INFORMATION	ILS 6 GENERATES KNOWLEDGE	ILS 7 RECOGNIZES IMPORTANCE OF INFO TO DEMOCRATIC SOCIETY	ILS 8 PRACTICES ETHICAL BEHAVIOR	ILS 9 SHARES AND COLLABORATES
Pre-Calculus										
	Standard 1: Relations and Functions									
	Students use polynomial, rational, and algebraic functions to write functions and draw graphs to solve word problems, to find composite and inverse functions, and to analyze functions and graphs. They analyze and graph circles, ellipses, parabolas, and hyperbolas.									
PC.1.1	Recognize and graph various types of functions, including polynomial, rational, algebraic, and absolute value functions. Use paper and pencil methods and graphing calculators.	x	x	x				x		
PC.1.2	Find domain, range, intercepts, zeros, asymptotes, and points of discontinuity of functions. Use paper and pencil methods and graphing calculators.	x	x	x				x		
PC.1.3	Model and solve word problems using functions and equations.	x	x	x	x	x	x	x		x
PC.1.4	Define, find, and check inverse functions.	x	x	x						
PC.1.5	Describe the symmetry of the graph of a function.	x	x	x						
PC.1.6	Decide if functions are even or odd.	x	x	x						
PC.1.7	Apply transformations to functions.	x	x	x						
PC.1.8	Understand curves defined parametrically and draw their graphs.	x	x	x						
PC.1.9	Compare relative magnitudes of functions and their rates of change.	x	x	x						
PC.1.10	Write the equations of conic sections in standard form (completing the square and using translations as necessary), in order to find the type of conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.).	x	x	x						
	Standard 2: Logarithmic and Exponential Functions									
	Students solve word problems involving logarithmic and exponential functions. They draw and analyze graphs, and find inverse functions.									
PC.2.1	Solve word problems involving applications of logarithmic and exponential functions.	x	x	x	x	x	x	x		x
PC.2.2	Find the domain, range, intercepts, and asymptotes of logarithmic and exponential functions.	x	x	x						
PC.2.3	Draw and analyze graphs of logarithmic and exponential functions.	x	x	x	x	x	x			
PC.2.4	Define, find, and check inverse functions of logarithmic and exponential functions.	x	x	x						

	Standard 3: Trigonometry in Triangles								
	<i>Students define trigonometric functions using right triangles. They solve word problems and apply the laws of sines and cosines.</i> http://id.mind.net/~zona/mmts/trigonometryRealms/trigonometryRealms.html								
PC.3.1	Solve word problems involving right and oblique triangles.	x	x	x	x	x	x	x	x
PC.3.2	Apply the laws of sines and cosines to solving problems.	x	x	x					
PC.3.3	Find the area of a triangle given two sides and the angle between them.	x	x	x					
	Standard 4: Trigonometric Functions								
	<i>Students define trigonometric functions using the unit circle and use degrees and radians. They draw and analyze graphs, find inverse functions, and solve word problems.</i>								
PC.4.1	Define sine and cosine using the unit circle.	x	x	x					
PC.4.2	Convert between degree and radian measures.	x	x	x					
PC.4.3	Learn exact sine, cosine, and tangent values for 0. Use those values to find other trigonometric values.	x	x	x					
PC.4.4	Solve word problems involving applications of trigonometric functions.	x	x	x	x	x	x	x	x
PC.4.5	Define and graph trigonometric functions (i.e., sine, cosine, tangent, cosecant, secant, cotangent).	x	x	x					
PC.4.6	Find domain, range, intercepts, periods, amplitudes, and asymptotes of trigonometric functions.	x	x	x					
PC.4.7	Draw and analyze graphs of translations of trigonometric functions, including period, amplitude, and phase shift.	x	x	x	x	x	x		
PC.4.8	Define and graph inverse trigonometric functions.	x	x	x	x	x	x		
PC.4.9	Find values of trigonometric and inverse trigonometric functions.	x							
PC.4.10	Know that the tangent of the angle that a line makes with x -axis is equal to the slope of the line.	x							
PC.4.11	Make connections between right triangle ratios, trigonometric functions, and circular functions.	x	x	x					
	Standard 5: Trigonometric Identities and Equations								
	<i>Students prove trigonometric identities, solve trigonometric equations, and solve word problems.</i>								
PC.5.1	Know the basic trigonometric identity $\cos^2 x + \sin^2 x = 1$.	x							
PC.5.2	Use basic trigonometric identities to verify other identities and simplify expressions.	x	x	x					
PC.5.3	Understand and use the addition formulas for sines, cosines, and tangents.	x	x	x					
PC.5.4	Understand and use the half-angle and double-angle formulas for sines, cosines, and tangents.	x	x	x					
PC.5.5	Solve trigonometric equations.	x	x	x	x	x	x		
PC.5.6	Solve word problems involving applications of trigonometric equations.	x	x	x	x	x	x	x	x
	Standard 6: Polar Coordinates and Complex Numbers								
	<i>Students define polar coordinates and complex numbers and understand their connection with trigonometric functions.</i>								
PC.6.1	Define polar coordinates and relate polar coordinates to Cartesian coordinates	x	x						
PC.6.2	Represent equations given in rectangular coordinates in terms of polar coordinates.	x	x	x					
PC.6.3	Graph equations in the polar coordinate plane.	x	x	x					
PC.6.4	Define complex numbers, convert complex numbers to trigonometric form, and multiply complex numbers in trigonometric form.	x	x	x					
PC.6.5	State, prove, and use De Moivre's Theorem.	x	x	x	x	x	x		

	Standard 7: Sequences and Series								
	<i>Students define and use arithmetic and geometric sequences and series, understand the concept of a limit, and solve word problems.</i> INSPIRE: Kids Link> Great Websites of Kids> Mathematics>MegaMathematics>Welcome to the Hotel Infinity.								
PC.7.1	Understand and use summation notation.	x	x	x					
PC.7.2	Find sums of infinite geometric series.	x							
PC.7.3	Prove and use the sum formulas for arithmetic series and for finite and infinite geometric series.	x	x	x	x	x	x		
PC.7.4	Use recursion to describe a sequence.	x	x	x					
PC.7.5	Understand and use the concept of limit of a sequence or function as the independent variable approaches infinity or a number. Decide whether simple sequences converge or diverge.	x	x	x					
PC.7.6	Solve word problems involving applications of sequences and series.	x	x	x	x	x	x	x	x
	Standard 8: Data Analysis								
	<i>Students model data with linear and non-linear functions.</i>								
PC.8.1	Find linear models using the mean fit and least squares regression methods. Decide which model gives a better fit.	x	x	x					
PC.8.2	Calculate and interpret the correlation coefficient. Use the correlation coefficient and residuals to evaluate a "best-fit" line.	x	x	x	x	x	x		
PC.8.3	Find a quadratic, exponential, logarithmic, power, or sinusoidal function to model a data set and explain the parameters of the model.	x	x	x					x
	Standard 9: Mathematical Reasoning and Problem Solving								
	<i>Students use a variety of strategies to solve problems.</i> http://www.stfx.ca/special/mathproblems/								
PC.9.1	Use a variety of strategies to problem-solving strategies, such as drawing a diagram, guess-and-check, solving a simpler problem, examining simpler problems, and working backwards.	x	x	x	x	x	x	x	x
PC.9.2	Decide whether a solution is reasonable in the context of the original situation.	x	x	x	x	x	x		
	<i>Students develop and evaluate mathematical arguments and proofs.</i>								
PC.9.3	Decide if a given algebraic statement is true always sometimes, or never (statements involving rational or radical expressions, trigonometric, logarithmic or exponential functions).	x	x	x					
PC.9.4	Use the properties of number systems and order operations to justify the steps of simplifying functions and solving equations.	x	x	x	x	x	x		
PC.9.5	Understand that the logic of equation solving begins with the assumption that the variable is a number that satisfies the equation, and that the steps taken when solving equations create new equations that have, in most cases, the same solution set as the original. Understand that similar logic applies to solving systems of equations simultaneously.	x	x	x					
PC.9.6	Define and use the mathematical induction method of proof.	x	x	x					

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		ACCESSES INFORMATION	EVALUATES INFORMATION	USES INFORMATION	PURSUES INFORMATION	APPRECIATES INFORMATION	GENERATES KNOWLEDGE	RECOGNIZES IMPORTANCE OF INFO TO DEMOCRATIC SOCIETY	PRACTICES ETHICAL BEHAVIOR	SHARES AND COLLABORATES
Calculus										
	Standard 1: Limits and Continuity									
	Students understand the concept of limit, find limits of functions at points and at infinity, decide if a function is continuous, and use continuity theorems.									
C.1.1	Understand the concept of limit and estimate limits from graphs and tables of values.	x	x	x						
C.1.2	Find limit by substitution.	x	x	x						
C.1.3	Find limits of sums, differences, products, and quotients.	x	x	x						
C.1.4	Find limits of rational functions that are undefined at a point.	x	x	x						
C.1.5	Find one-sided limits.	x	x	x						
C.1.6	Find limits at infinity.	x	x	x						
C.1.7	Decide when a limit is infinite and use limits involving infinity to describe asymptotic behavior.	x	x	x						
C.1.8	Find special limits.	x	x	x						
C.1.9	Understand continuity in terms of limits.	x	x	x						
C.1.10	Decide if a function is continuous at a point.	x	x	x						
C.1.11	Find the types of discontinuities of a function.	x	x	x						
C.1.12	Understand and use the Intermediate Value Theorem on a function over a closed interval.	x	x	x	x	x	x			
C.1.13	Understand and apply the Extreme Value Theorem: If $f(x)$ is continuous over a closed interval, the f has a maximum and minimum on the interval.	x	x	x	x	x	x			
	Standard 2: Differential Calculus									
	Students find derivatives of algebraic, trigonometric, logarithmic, and exponential functions. They find derivatives of sums, products, and quotients, and composite and inverse functions. They find derivatives of higher order, and use logarithmic differentiation and the Mean Value Theorem.									
C.2.1	Understand the concept of derivative geometrically, numerically, and analytically, and interpret the derivative as a rate of change.	x	x	x	x	x	x			
C.2.2	State, understand and apply the definition of derivative.	x	x	x						
C.2.3	Find the derivatives of functions, including algebraic, trigonometric, logarithmic, and exponential functions.	x	x	x						
C.2.4	Find the derivatives of sums, products, and quotients.	x	x	x						
C.2.5	Find the derivatives of composite functions, using the chain rule.	x	x	x						
C.2.6	Find the derivatives of implicitly-defined functions.	x	x	x						

C.2.7	Find derivatives of inverse functions.	x	x	x						
C.2.8	Find second derivatives and derivatives of higher order.	x	x	x						
C.2.9	Find derivatives using logarithmic differentiation.	x	x	x						
C.2.10	Understand and use the relationship between differentiability and continuity.	x	x	x						
C.2.11	Understand and apply the Mean Value Theorem.	x	x	x						
	Standard 3: Applications of Derivatives									
	<i>Students find slopes and tangents, maximum and minimum points, and points of inflection. They solve optimization problems and find rates of change.</i>									
C.3.1	Find the slope of a curve at a point, including points at which there are vertical tangents and no tangents.	x	x	x						
C.3.2	Find a tangent line to a curve at a point and a local linear approximation.	x	x	x						
C.3.3	Decide where functions are decreasing and increasing. Understand the relationship between the increasing and decreasing behavior of f and the sign of f' .	x	x	x						
C.3.4	Find local and absolute maximum and minimum points.	x	x	x						
C.3.5	Analyze curves, including the notions of monotonicity and concavity.	x	x	x	x	x	x			
C.3.6	Find point of inflections of functions. Understand the relationship between the concavity of f and the sign of f'' . Understand points of inflection as places where concavity changes.	x	x	x						
C.3.7	Use first and second derivatives to help sketch graphs. Compare the corresponding characteristics of the graphs of f , f' , and f'' .	x	x	x						x
C.3.8	Use the implicit differentiation to find the derivative of an inverse function.	x	x	x						
C.3.9	Solve optimization problems.	x	x	x	x	x	x	x		x
C.3.10	Find average and instantaneous rates of change. Understand the instantaneous rate of change as the limit of the average rate of change. Interprets a derivative as a rate of change in applications including velocity, speed, and acceleration.	x	x	x	x	x	x			
C.3.11	Find the velocity and acceleration of a particle moving in a straight line.	x	x	x						
C.3.12	Model rates of change, including related rates problems.	x	x	x	x	x	x			
	Standard 4: Integral Calculus									
	<i>Students define integrals using Riemann Sums, use the Fundamental Theorem of Calculus to find integrals, and use basic properties of integrals. They integrate by substitution and find approximate integrals.</i> INSPIRE: Links>Kid's Stuff>High School Hub> Mathematics>Visual Calculus Tutorials> Tutorials> Integration.									
C.4.1	Use rectangle approximations to find approximate values of integrals.	x	x	x						
C.4.2	Calculate the values of Riemann Sums over equal subdivisions using left, right, and midpoint evaluation points.	x	x	x						
C.4.3	Interpret a definite integral as a limit of Riemann Sums.	x	x	x	x	x	x			
C.4.4	Understand the Fundamental Theorem of Calculus: Interpret a definite integral of the rate of change of a quantity over an interval as the change of the quantity over the interval.	x	x	x	x	x	x			
C.4.5	Use the Fundamental Theorem of Calculus to evaluate definite and indefinite integrals and to represent a particular antiderivative. Perform analytical and graphical analysis of functions so defined.	x	x	x	x	x	x			
C.4.6	Understand and use these properties of definite integrals.	x	x	x						
C.4.7	Understand and use integration by substitution (or change of variable) to find values of integrals.	x	x	x						
C.4.8	Understand and use Riemann Sums, the Trapezoidal Rule, and technology to approximate definite integrals of functions represented algebraically, geometrically, and by tables of values.	x	x	x						

DM.5.1	Use election theory techniques to analyze election data.	x	x	x	x	x			
DM.5.2	Use weighted voting techniques to decide voting power within a range.	x	x	x					
DM.5.3	Use fair division techniques to divide continuous objects.								
DM.5.4	Use fair division techniques to solve apportionment problems.	x	x	x					
	Standard 6: Linear Programming								
	<i>Students use linear programming techniques.</i>								
DM.6.1	Use geometric techniques to solve organizational problems.	x	x	x					
DM.6.2	Use the Simplex method to solve optimization problems with and without technology.	x	x	x					
	Standard 7: Game Theory								
	<i>Students use game theory.</i>								
DM.7.1	Use game theory to solve strictly determined games.								
DM.7.2	Use game theory to solve non-strictly determined games.								

	Standard 3: Statistical Inference								
	<i>Students use confidence intervals and hypothesis tests, fit straight lines to data, and calculate correlation coefficients.</i>								
PS.3.1	Compute and use confidence intervals to make estimates.	x	x	x					
PS.3.2	Understand hypothesis tests of means and differences between means and use them to reach conclusions.	x	x	x	x	x	x		
PS.3.3	Use the principle of least squares to find the curve of best fit for a set of data.	x	x	x					
PS.3.4	Calculate and interpret the correlation coefficient of a set of data.	x	x	x	x	x	x		